UNIVERSITY of VIRGINIA
BIOCOMPLEXITY INSTITUTE

UVA COVID-19 MODEL WEEKLY UPDATE

VDH VIRGINIA DEPARTMENT OF HEALTH

May 7th, 2021

KEY TAKEAWAYS

- 24 health districts show a declining case trajectory this week, while six health districts are now in slow growth.
- Wide regional variation in case projections persists, driven in large part by differences in vaccine acceptance rates. High vaccine acceptance in the Northern Region leads to optimistic projections in those health districts.
- National projections mirror those seen in Virginia, with faster declines in case rates occurring in scenarios with high vaccination rates.

14 per 100k
Average Daily Cases
Week Ending May 2, 2021

73 per 100k
Potential Peak Average Daily Cases, Week Ending August 1, 2021 with B.1.1.7 Variant & Pandemic Fatigue

13 per 100k
2020 Summer Peak
Week Ending Aug 2, 2020

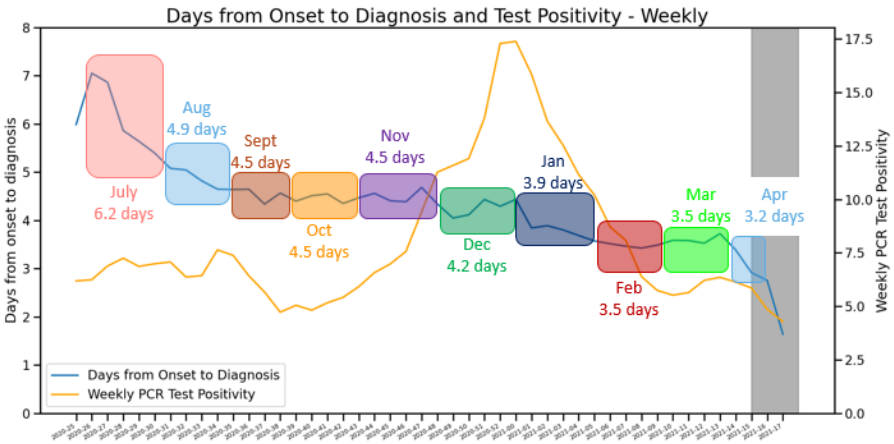
68 per 100k
Highest Peak Average Daily Cases
Week Ending Jan 24, 2021

KEY FIGURES

Reproduction Rate
(Based on Confirmation Date)

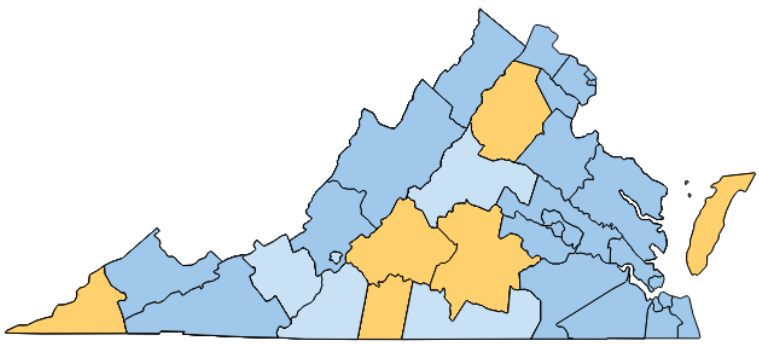
Region	R_e May 3	Weekly Change
State-wide	**0.873**	**0.094**
Central	0.903	0.115
Eastern	0.891	0.075
Far SW	0.879	0.063
Near SW	0.942	0.142
Northern	0.772	-0.008
Northwest	0.957	0.103

Case Detection



Growth Trajectories: 0 Health Districts in Surge

Status	# Districts (prev week)
Declining	24 (22)
Plateau	5 (9)
Slow Growth	6 (2)
In Surge	0 (2)



VIRGINIA'S HEALTH IS IN OUR HANDS. Do your part, stop the spread.

UVA COVID-19 MODEL WEEKLY UPDATE

THE MODEL

The UVA COVID-19 Model and the weekly results are provided by the UVA Biocomplexity Institute, which has over 20 years of experience crafting and analyzing infectious disease models. It is a (S)usceptible, (E)xposed, (I)nfected, (R)ecovered epidemiologic model designed to evaluate policy options and provide projections of future cases based on the current course of the pandemic.

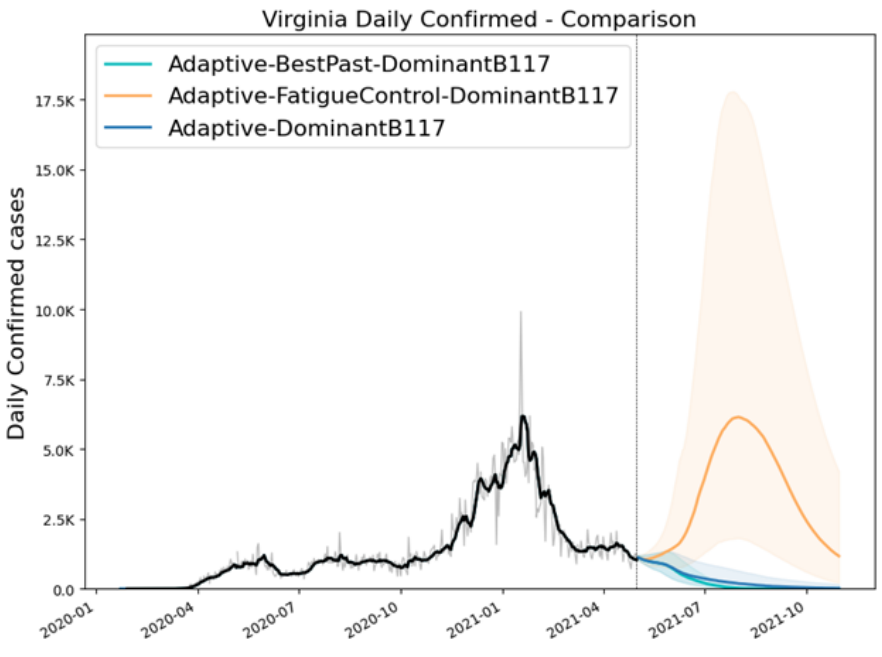
COVID-19 is a novel virus causing a global pandemic and response. The model improves as we learn more about it.

THE PROJECTIONS

The UVA team continues to improve the model weekly. The UVA model uses an "adaptive fitting" methodology, where the model traces past and current trends and uses that information to predict future cases at the local level. The model incorporates projections on the impact of vaccines, which will improve over time. Since the B.1.1.7 Variant has become dominant, the model includes increased transmission and severity associated with this Variant of Concern. The model also includes "what-if" or planning scenarios. The "Fatigued Control" scenario identifies the highest transmission rates seen during summer 2020 and projects those forward. The "Best Past" scenario does the opposite, identifying the lowest transmission rates seen since May 2020, projecting them forward.

MODEL RESULTS

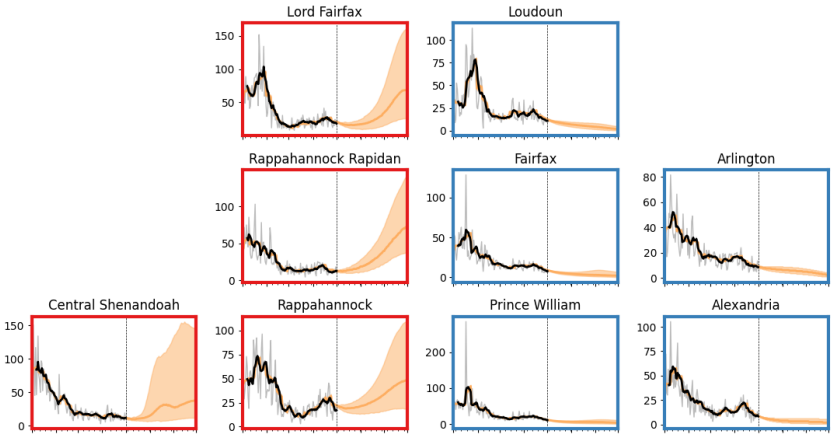
With the B.1.1.7 variant becoming predominant, the model shows a continued decline in new weekly cases along the current course, but warns of a surge in cases that could occur if Virginians relax precautions. Under the current course, model scenarios show that cases peaked at **68 average daily cases** per 100,000 residents during the week ending **January 24th**. However, under the Fatigued Control - Dominant B.1.1.7 scenario, if Virginians relax their behavior as Variants of Concern take hold, cases will reach a higher peak with **73 average daily cases** per 100,000 the week ending **August 1st**. To lessen the projected peak, we must give vaccines time to have an impact, especially as the B.1.1.7 variant is the predominant strain in Virginia. **Do your part to stop the spread. Continue to practice good prevention and get vaccinated when eligible.**



VARIATION ACROSS VIRGINIA

The UVA model shows a continued case decline under the current course and the best of the past scenarios, but a large summer peak under the worst-case Fatigue Control scenario. These projections result from an average of the projected trajectories in each of the 35 health districts. Upon closer look, there is tremendous regional variation. While some districts can expect to see a surge in cases under the Fatigue Control scenario, others are likely to avoid it.

A snapshot of the Northern and Northwest districts shows an example of this regional variation. Even under the worst-case scenario, the Northern Region can expect to avoid another peak. Conversely, several districts in the Northwest could experience another surge if behavior relaxes as variants predominate. Across the state, most health districts look like the Northwest districts. However, Henrico, Chesterfield, Richmond, Chesapeake, and Roanoke City join the Northern health districts in avoiding another surge even under the worst-case scenario.



Vaccine Acceptance

Vaccination rates are the driving factor behind the wide regional variation. Estimates for vaccine acceptance rates vary from a low of 41% in the Eastern Region to 87% in the Northern Region. With such high vaccine acceptance and uptake, the outlook in Northern Region can remain optimistic even under a worst-case scenario. The optimistic projections rely on continued vaccine acceptance, so these districts should strive to maintain high rates.

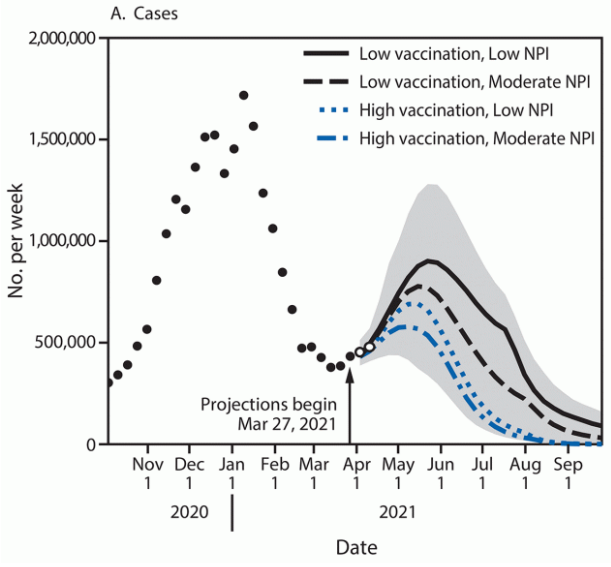
Improved vaccine uptake across the state can help other health districts reach similar projections. With continued adherence to nonpharmaceutical interventions and high vaccination rates, Virginia can stave off another surge.

National Projections

The UVA model provides one of many COVID-19 projections nationwide. While Virginia is its focus, the UVA model also projects cases, hospitalizations, and deaths across the country. Recently, the COVID-19 Scenario Modeling Hub compiled models from six teams, including the UVA Biocomplexity Institute, to form national projections under four different scenarios.

As with the UVA model, these national projections show better outcomes under high vaccination scenarios. Results featured in the MMWR show fewer cases in a high vaccination scenario when paired with moderate nonpharmaceutical interventions (NPIs) such as social distancing and wearing a mask. Even with low NPIs, high vaccination rates could lead to a faster decline in cases compared to a moderate NPI scenario with low vaccination rates.

As seen in the figure on the right, all scenarios from the COVID-19 Scenario Modeling Hub project an increase in cases in the spring followed by a decline in early summer.



The UVA model is one of six models combined to create national projections for COVID-19 cases, hospitalizations, and deaths through the COVID-19 Scenario Modeling Hub.